FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
INTEGRATED SAFETY MANAGEMENT SYSTEM VERIFICATION REPORT

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Ohio Field Office

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I, by signature here, acknowledge that I concur with the TEAM LEADER and SENIOR ADVISOR in the issues and conclusions of this report of the Integrated Safety Management System Verification in my assigned functional area.

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Executive Summary

Department of Energy (DOE) Policy (P) 450.4, Safety Management System Policy commits to institutionalizing an Integrated Safety Management System (ISMS) throughout the DOE complex. The DOE Acquisition Regulations (DEAR, 48 CFR 970) require contractors to manage and perform work in accordance with a documented ISMS.

The Manager, Ohio Field Office (OH), initiated this combined Phase I and Phase II ISMS Verification Review to confirm that the Fernald Environmental Management Project (FEMP) has prepared an adequate description of it's ISMS (Phase I) and had implemented ISMS within the site facilities and processes (Phase II). This verification review was requested in a memorandum by DOE/FEMP, in which DOE/FEMP recommended approval of the FEMP ISMS. The general conduct of the review was consistent with the direction provided by the Under Secretary's Safety Management System Review and Approval Protocol.

The purpose of this ISMS Verification was to provide the Manager, OH, with a recommendation on the adequacy of the ISMS description at FEMP, based upon compliance with the requirements of 48 CFR 970.5204 (-.2 and -.78) and DOE P 450.4, and to provide an evaluation of the extent and maturity of ISMS implementation within FEMP. The verification was conducted from April 13 through April 23, 1999.

The Team does not recommend approval of the FEMP ISMS Description, RM-0016, Appendix N, Revision 4, dated March 15, 1999. The team found that the document contains numerous inaccuracies and inconsistencies. The document does not depict a coherent flowdown of requirements. Numerous procedures specifically identified in the description did not implement or "flowdown" the ISMS element(s) attributed to it. FDF formally submitted a document with previously identified deficiencies that had not been corrected, which DOE/FEMP subsequently endorsed.

With the contractor's failure to develop an adequate description for Phase I verification, a determination of the total implementation in Phase II was not possible. The Team Leader decided, however, to keep the team on site and verify implementation to the extent possible those portions of ISMS that were in place. The results of this review indicate that many elements of ISMS have been implemented at the activity level. The team's work in this area will be included in the scope of the subsequent verification and should substantially reduce that effort.

TABLE OF CONTENTS

1.0 INTRODUCTION

The Department of Energy (DOE) directed institutionalization of an Integrated Safety Management System (ISMS) throughout the DOE complex in DOE Safety Management System Policy (P 450.4). This direction is incorporated in DOE Acquisition Regulations (DEAR, Title 48, Code of Federal Regulations, Part 970, referred to as 48 CFR 970.5204-2 and -78) and DOE site operations contracts which require contractors to manage and perform work in accordance with documented ISMS processes.

At the Fernald Environmental Management Project (FEMP) site, guidance and expectations for ISMS implementation were provided to the prime contractor, Fluor Daniel Fernald, Inc. (FDF), by Ohio Field Office, Fernald Environmental Management Project Office (DOE/FEMP) letter of March 1998. ISMS was also incorporated into the FEMP operating contract DE-AC24-920R21972. This has resulted in the development of the Integrated Safety Management System (ISMS) Plan, RM-0016, Appendix N and site implementation.

The April 2, 1999 DOE/FEMP to DOE/OH letter states that FEMP has prepared an Integrated Safety Management System Description (RM-0016, Appendix N), implemented the process, and is prepared for final verification by the Ohio Field Office. DOE/FEMP recommended approval of the FDF ISMS System Description.

This ISMS Verification, Phase I and Phase II, was conducted to verify and confirm the adequacy of the ISMS description in fulfilling the requirements of the DEAR and DOE Policy, and to determine the degree of its implementation at FEMP. The verification was conducted for the Manager, Ohio Field Office, in accordance with the Integrated Safety Management System Verification (ISMSV) Process, Team Leaders Handbook, DOE-HDBK-XXX-98, November 1998. Mr. Raymond Powell, Nuclear Engineer, Ohio Field Office, Office for Compliance and Support, was appointed Team Leader in accordance with the Handbook by the Manager, Ohio Field Office, by Letter of Appointment dated March 25, 1999 (Appendix A).

2.0 PURPOSE

The purpose of this ISMS Verification was to confirm the adequacy of the FEMP ISMS Description, relative to the requirements of DEAR, CFR, and DOE Policy

450.4, and to provide the Manager, Ohio Field Office, with a recommendation of ISMS approval or identification of areas which must be improved before approval. This recommendation shall be based on whether the FEMP ISMS Description has satisfied the letter and intent of DOE Policy 450.4 and the requirements of 48 CFR 970.5204 (-.2 and -.78), and has been implemented.

The review was also intended to verify that the DOE Ohio Field Office and Fernald Environmental Management Project Office responsibilities for ISMS are assigned and are being properly implemented. The implementation of DOE Policy 450.5, Line ES&H Oversight, was also to be verified in accordance with the Ohio Strategic Plan.

Additionally, this review provides the Ohio Field Office the opportunity to continue to improve future Ohio Project Office ISMS Verifications by formally capturing the lessons learned from the review.

3.0 SCOPE

The scope of the review was to verify that the FEMP had met the letter and intent of Department of Energy Policy (P) 450.4, which states:

The Department and Contractors must systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment. This is to be accomplished through effective integration of safety management into all facets of work planning and execution. In other words, the overall management of safety functions and activities becomes an integral part of mission accomplishment.

This was to be accomplished by verifying that the FEMP ISMS Description (RM-0016, Appendix N) meets the requirements of 48 CFR 970.5204.2 and .78 (Phase I) and that implementation has occurred throughout the site (Phase II). Phase I consisted of a review of the adequacy of the FEMP ISMS Description, and supporting directives and requirements, to fulfill the core functions and guiding principles of DOE P 450.4. Phase II was to confirm the satisfactory implementation of ISMS using the legal and contractual requirements for doing work safely.

Although all facilities were subject to review, a representative set of facilities and programs was selected over a range of hazard classifications (i.e. from Nuclear Hazard Category 2 to Standard Industrial) and activity levels (i.e. from active storage facilities and environmental restoration activities to facilities which have undergone safe shutdown or are in the process of D&D). The Team Leader also directed attention toward any other facilities deemed necessary to verify the adequacy of site wide ISMS implementation.

In addition to the contractor's ISMS Description and implementation, the review was intended to verify that the DOE Ohio Field Office and Fernald Environmental Management Project Office responsibilities for ISMS are assigned and being properly implemented. These responsibilities are defined in the Ohio Field Office Functions, Responsibilities, and Authorities Manual, OH-0412-99, March 2, 1999.

The review of DOE ISMS aspects included the following: preparation and approval of mission assignments and program guidance, allocation of resources to support the mission and safety requirements, and management guidance to the staff regarding the safety management system. In addition, the Team reviewed DOE's participation in budget and program management by executive, program and project staff, the Authorization Agreement to implement specific programs and processes as part of the authorization basis, and ability to direct and monitor activities according to the terms and conditions of the Authorization Agreement.

The team evaluated technical qualifications and experience of key members of the Ohio Field Office and Fernald Environmental Management Project Office staff to monitor trends and oversee contining application of ISMS. The review of staff competence did not duplicate previous reviews or assessments, but verified the capabilites of DOE staff to direct, monitor, and evaluate contractor actions to resolve issues, implement recommendations, and maintain continuous improvement programs.

4.0 SCOPE CONSIDERATIONS

Many aspects of the FEMP ISMS have been the subject of previous reviews. This team duplicated the scope of previous reviews only to the extent necessary to verify their adequacy, correct identification of deficiencies, adequate deficiency resolution, and proper execution of continuous improvement programs at FEMP. Several FEMP safety programs were identified as satisfactory by previous independent reviews. These programs were included within this ISMS review only to the degree necessary to ensure ISMS has been expanded to all facilities and activities at the Fernald Environmental Management Project. The following reviews were considered in defining the ISMS review scope and conducting of the ISMS review:

- An ISMS self-assessment conducted by FDF in August 1998. Titled "Independent Oversight Evaluation of Environment, Safety and Health Programs, Implementation of Integrated Safety Management", August 1998, this report documents the implementation status of the ISMS principles and functions at FEMP. The review should take into account this ISMS self-assessment and place emphasis on the adequacy of the self-assessment and the actions taken to resolve issues and to implement recommendations.

- A follow-up review of the 1996 DOE independent oversight evaluation of environment, safety and health programs at the FEMP, conducted by the DOE Office of Oversight in September 1998. The report of this follow-up review, dated October 1998, noted areas of significant improvement in specific programs and disciplines, but also identified opportunities for improvement. This ISMS verification took into account actions taken in response to this follow-up review with emphasis on recommended improvements.

5.0 VERIFICATION APPROACH

The review was performed using the guidance provided in sections 5 and 6 of DOE G 450.4, as amplified by DOE letter OH-0566-99, Dever to Powell, dated March 25, 1999. A set of Criteria Review and Approach Documents (CRADs) was constructed based on the Verification Team Leader's Handbook, DOE-HDBK-XXX-98, November 1998. The CRADs were designed to ensure that all core expectations set forth in the handbook were reviewed in detail. The CRADs were structured along the following functional areas:

- Business, Budget, and Contracts (BBC)
- Hazards Identification and Standards Selection (HAZ)
- Management (MG)
- Department of Energy (DOE)
- Operations (OP)
- Subject Matter Experts (SME)

The CRADs were assigned to one of the three verification subteams:

- Institutional (FDF and DOE)
- Facility/Project
- Operations/Subject Matter Experts

This subteam structure was designed to accomplish a horizontal and vertical review of the ISMS at Fernald. Horizontally, two organizational levels were identified for review: Institutional and Facility/Project Level. The vertical review, designed to trace specific health and safety requirements from higher level documents down to actual field implementation, was conducted by the Operations/Subject Matter Expert subteam.

The intent of this approach was to verify the integration of all core functions and guiding principles throughout the site including both DOE and FDF.

Using the CRADs, the team examined the application of ISMS principles and functions to Fernald safety management systems and processes. Each CRAD contained an objective to fulfill one or more of the Verification Team Leader's Handbook core expectations. For each objective, criteria were provided to assist the Team in determining whether the objective had been met. Lines of inquiry provided team members guidance to perform the verification of Phase I and II activities.

5.1 Institutional Level Verification

The institutional level review focused on the Ohio Field Office, FEMP, and FDF structures designed to develop, implement, and continuously improve the application of ISMS core functions and guiding principles. The general structure of the ISMS, compared to the criteria and expectations outlined in DOE 450.4 policy and guidance, was evaluated.

The Ohio Field Office and FEMP institutional level review examined the integration of ISMS within policies, procedures, contracts, and other documents in accordance with DOE 450.4 policy and guidance, DEAR 970.5204.2 and 970.5204.78, and FRAM DOE M 411.1. The DOE's ability to monitor the initial and continuing implementation of the site ISMS was also reviewed.

The team interviewed DOE and FDF corporate institutional management personnel using established lines of inquiry to obtain a thorough understanding of the systems established, implemented, and maintained within the Safety Management System Description. This integrated procedure framework is designed to provide to FDF and FEMP the following: policies, requirements, standards, procedures and guidelines that are current, accurate, and relevant to the work being performed. The team examined ISMS implementation via these documents, as directed by the appropriate CRADs.

Fluor Daniel Fernald's management structure is organized by facility operations (projects) and functional (programmatic) responsibilities. Four senior managers are responsible for operations and project activities (Facilities Closure & Demolition Projects; Soil & Water Projects; Waste Management; and Silos Projects). These management organizations were reviewed by the verification team to understand and evaluate the overall and specific management systems used to implement and maintain ISMS.

The Authorization Agreement for applicable FEMP activities was examined for adequacy of coverage and linkage to the overall principles and function of ISMS.

5.2 Facility and Project Level Verification

This verification review utilized Facility and Project Level CRADs, which were based on general guidance in the Team Leader's Handbook and modified to suit specific facilities and projects at FEMP.

Linkage between the Authorization Agreement and facilities/projects documents was examined to confirm incorporation of ISMS guiding principles and core functions. Also, the relationship of line and support organizations to maintain the

authorization basis envelope was verified for the tailored ISMS as described in guidance in DOE P 450.4.

The trail (flowdown) of requirements and their implementation from top levels of facility/project management to working levels within the facilities/projects was evaluated. The ties and connections between the project teams and support organizations were examined for ISMS linkage. Selected aspects of work planning and control, authorization agreements, and configuration management were reviewed to confirm links between these project and project support functional lines of responsibility.

The activity level review included a comprehensive examination of the operational line organizations that accomplish the organizational missions and objectives. The team reviewed the activity level processes by examining the management system and tracking individual projects and work tasks through their life cycle, and mapping performance against the criteria stated in the CRADs.

Projects and work packages for this review were selected from a listing of new, ongoing and completed projects. This listing was supplied by the contractor and included a categorization of the projects by general size, complexity, and hazard potential. Selection of some projects and work packages in various stages of the management life cycle enabled the team to ascertain the degree to which ISMS core functions and guiding principles have been implemented.

The various tools and programs used to manage and control projects and work planning were reviewed. Emphasis was placed on evaluating the maturity of the governing ISMS processes controlling the entire project life cycle. Work control and authorization mechanisms were similarly evaluated. Some processes, due to their crosscutting nature, were examined by more than one subteam.

The Team interviewed selected project and activitiy level line management, including individual project coaches and project managers, team leaders, work supervisors, work planners, workers, and union representatives to verify that ISMS principles had been incorporated throughout the project/work management life cycle. Roles and responsibilities were examined as well as staff qualification and competence.

5.3 Subject Area Verification

A subteam of Operations/Subject Matter Experts evaluated through vertical slices of selected functional areas whether ISMS processes had been documented (Phase I) and implemented (Phase II). Some of these areas represent topics of current interest while others cover basic elements of operations, safety, and work at the task level. These specific areas were: Operations, Maintenance, Construction, D&D, Hazard Analysis, Feedback and Improvement, Environmental Protection, Radiation Protection, Occupational Safety & Health, and Environmental Restoration & Waste Management. Subject matter experts in this subteam reviewed each functional area.

The scope of this effort was to examine the flowdown of ISMS requirements and interrelationships of organizations which implement the ISMS processes and mechanisms from the perspective of each functional subject area. Subject matter experts developed review methods consistent with the CRADs and approved by the Team Leader; thereby maintaining the focus on examining process and function rather than compliance.

5.4 Facilities/Projects

As stated in the FEMP Integrated Safety Management System Plan, ISMS encompasses all work by FDF and all work subcontracted by FDF to support the mission of the FEMP. Accordingly, facilities/projects were not specifically selected in advance of the verification visit. The facilities/projects included in the verification review were selected after the initial DOE/FDF briefings with consideration given to planned site activities during the team visit. However, to develop the broadest and most representative view of the FEMP ISMS system, high, intermediate and low hazard projects were selected.

5.5 Evaluation Criteria

Each CRAD evaluated: (1) the adequacy of the ISMS Description to fulfill the application of the ISMS core functions and guiding principles through application of the documents described within (Phase I) and (2) the adequacy of the implementation of the prescribed processes throughout the FEMP (Phase II). The following evaluation categories were established, consistent with the standard ISMS verification team protocol.

DEFICIENCIES

Phase I	The ISMS Description does not include an ISMS element in the	docum
Phase II	A documented process or procedure described within the ISMS	Descri

AREAS FOR IMPROVEMENT

Phase I	The ISMS Description includes the ISMS processes but the documented processes and procedures do not adequately address the ISMS core functions and guiding principles .	
Phase II	A documented process or procedure described within the ISMS vertically or horizontally.	Descri

NOTEWORTHY PRACTICES

Noteworthy practices capture team observations of excellent aspects of FEMP's ISMS Description or implementation of guiding principles or core functions. This evaluation category is intended to acknowledge FEMP's success and to record positive lessons learned for use throughout the DOE complex.

6.0 ADMINISTRATION

Raymond J. Powell, Nuclear Engineer, Ohio Field Office, Office for Compliance and Support, was the Team Leader for the Fernald ISMS Verification Review. The Manager, Ohio Field Office, appointed Mr. Powell by Letter of Appointment dated March 25, 1999 (Appendix A).

6.1 Team Organization

Three Sub-teams at two organizational ISM levels and in the Operations/Subject Matter Expert areas (Figure 1) conducted this verification review. This subteam structure was designed to accomplish a horizontal and vertical review of the ISMS at Fernald. Horizontally, two organizational levels were identified for review: Institutional and Facility/Project Level. The vertical review, designed to trace specific health and safety requirements from higher level documents down to actual field implementation, was conducted by the Operations/Subject Matter Expert subteam.

6.2 Team Composition

Team members were selected based upon the criteria established by the February 21, 1997, Memorandum from the Under Secretary of Energy. These criteria are:

- Expertise in one or more functional areas
- Appraisal experience
  * Familiarity with the site/facility mission and processes, or
  * Knowledge, understanding, and training on Integrated Safety Management

The ISMSV team contained three subteams. The subteams consisted of two organizational ISM levels (Institutional and Facility & Activity/Task) and a Operations/Subject Matter Expert (Figure 1).

Subject matter experts were assigned to functional areas including Operations, Maintenance, Construction, D&D, Hazard Analysis, Feedback and Improvement, Environmental Protection, Radiation Protection, Occupational Safety & Health, and Environmental Restoration & Waste Management. Team member qualifications were validated and documented by the Team Leader in accordance with the Under Secretary's directions. Team roster and qualification summaries are in Appendix B.

6.3 Team Preparation

Proper preparation of team members was critical to the performance of this verification, preparation of a credible report, and the development of a recommendation for the Manager, Ohio Field Office, on the FEMP ISMS Description and its implementation status. Therefore, members were required to prepare for their individual assignments by completion of the following reading and activities. The required reading list for each team member is listed on individual qualification summaries (Appendix B).

Team reading requirements:
- Fernald ISMSV Plan
- Safety Management System Policy, DOE P 450.4
- Ohio Safety Management Policy, OH-40.S003, Revision 1-B
- Integrated Safety Management System Guide, DOE G 450.4
- FDF ISMS Program Description, RM-0016, Appendix N, Rev.4

Team members were required to attend Executive Level ISMS Training conducted by a SMIT (Safety Management Implementation Team) qualified trainer. This training was performed the day of arrival at the FEMP.

Team members were also required to complete training necessary to perform the verification on site. Site-specific training was provided at the FEMP upon arrival.

Team member qualification summaries were submitted to the Team Leader for approval and are incorporated into Appendix B of this report.

6.4 Site Coordination and Support

FEMP and contractor staff were requested to be available to assist the team and provide support on an as needed basis before and during the visit. The Office of Safety and Assessment of FEMP hosted the team and provided the primary support. The principle point-of-contact was, Joe Neyer, Team Leader, Project Assessment.

6.5 Schedule

The review was conducted between April 13 and April 23, 1999, inclusively. Activities for the first day included team introductions, ISMSV training, required site training, and site SMS Description and implementation presentations. The daily schedule included daily status meetings of team members and FEMP representatives at 4:00 p.m., with an emphasis placed on sharing cross-cutting issues and identifying potential areas/activities to be pursued on the next day.

7.0 CONCLUSION

The team determined that the FEMP ISMS Description, RM-0016, Appendix N, Revision 4, dated March 15, 1999 should not be approved by the Ohio Field Office Manager. The document contains numerous inaccuracies and inconsistencies. The document does not depict a coherent flowdown of requirements. Numerous procedures specifically identified in the description did not implement or "flowdown" the ISMS element(s) attributed to them. FDF formally submitted a document with previously identified deficiencies that had not been corrected, which DOE/FEMP subsequently endorsed.

The team identified deficiencies and areas for improvement. The specific issues are listed in sections 8.0 and 9.0. Among the more significant issues, in addition to the system description issue, is the current state of the site S/RIDs. The S/RIDs are consistently identified as the baseline for safety documentation. The proposed draft revision to the ISMS Description emphasizes the flow through the S/RIDs (both vertically and horizontally). Despite this emphasis, the S/RIDs are not current, are not updated in accordance with site procedures, and appear to have insufficient resources allocated to bring them current and subsequently maintain them.

By the established ISMS protocol, this review could have been terminated during the first week. After discussion with DOE/FEMP management and verification team members, the team leader decided to continue - realizing the review will in part have to be reaccomplished. The decision was based on: (1) the fact that resources were already extended having mobilized the team on site, (2) there was indication that many elements of ISMS had been implemented at the activity level, and (3) the remainder of the review would be of value to the FEMP and would provide a basis for limiting the scope of a subsequent verification review.

8.0 LIST OF DEFICIENCIES

1. The ISM System Description, RM-0016, Appendix N, Rev 4, is not consistent with and does not adequately implement the DEAR clause 970.5204-2 and DOE Policy 450.4 (MG.1-I)

2. FDF procedures do not provide for effective flowdown of ISM requirements into subcontracts. (BBC.1-I)

3. The S/RIDs are not maintained current and do not ensure the flowdown of the appropriate drivers for the integration of safety within the Project Execution Plans and subsequent task/activity level documents. (HAZ.2-I/II)

9.0 LIST OF AREAS FOR IMPROVEMENT

1. The FDF procedures governing budgeting, scheduling and planning should be revised to either state the relative priority for ISM, or reference a document which does, such as the Management Plan. (BBC.2-I)

2. Maintenance procedures do not identify managers/supervisors/facility owners as being responsible for safety. (F-MG.4-I)

3. The Performance Planning and Assessment (PAA) procedure and process for FDF employee performance appraisals should include a safety category as a performance goal or instructions for the development of additional performance expectations to include safety goals. (BBC.3-I)

4. DOE/FEMP should employ a more in-depth and thorough assessment process, sufficient to validate all elements of a specific program, prior to requesting independent review. (DOE.2-II)

5. DOE/FEMP processes for maintenance of ISMS List A & B documentation could be improved by the formalization of a Fernald Implementing Procedure (FIP). (DOE.2-I)

6. DOE/FEMP implementation of P450.5, Line ES&H Oversight, could be completed by adding the appropriate reference in FIP-7206, “DOE-FEMP Contractor Monitoring” - all elements are currently in the document. (DOE.1-I)

7. The Addendum II Technical Qualification Matrix in the DOE-FEMP Technical Management Plan is erroneous and needs to be corrected. (DOE.1-I)

8. The flowdown of the safety authorization basis into the work process documents should be clearly defined. (F-HAZ.2-II)

9. The Project Manager, Project Engineer, and Construction Manager training programs should be modified to include FDF ISMS description, document hierarchy, and S/RIDs. (BBC.3-I)

10. Incorporate a more descriptive set of user friendly drivers within S/RID 19, Acquisition, rather than specifying only the Prime Contract. (HAZ.2-I/II)

11. PEPs and Operations Standing Orders provide discussions, but do not adequately address the criteria of ISM Core Expectation 5, Feedback and Continuous Improvement (F-MG.2-II)

12. Develop an integrated and documented process to capture management decision's that were based on feedback (MG.3-I)

10.0 LIST OF NOTEWORTHY PRACTICES

1. The joint effort of Human Resources, Training, and Line and Functional Managers in the establishment and maintenance of technical qualifications and training requirements results in an excellent product. (F-MG.4-I)

2. The Enhanced Work Planning efforts at Fernald is an excellent model for the DOE complex. (FB/MG.5-I/II)

11.0 LESSONS LEARNED

1. Bring or arrange for the site to provide current vintage computers. Site computers provided were old and slow, not reliable, and the one printer failed.

2. Access to site intranet and training on how to use it has been part of ISMS reviews at other sites. This would have been helpful in understanding site paper and operations, being able to view commitment and action tracking systems, and site procedures and documents. Temporary passwords and nondisclosure agreements could have been executed.

3. Interviews were difficult to schedule, conflicts arose, and better communication of scheduled interview times and names to the team would have been helpful.

4. The Team Leader should provide specific written guidance on the content of opening presentations.

5. The ISM system description should be developed using a process that demonstrates participation, ownership, and acceptance of line project and safety professional personnel at the site.

REFERENCES

1. DOE Safety Management System Policy, DOE P 450.4.

2. DOE Safety Management System Guide, Volumes 1 and 2, DOE G 450.4-1.

3. DOE Safety Management Systems Verification (ISMSV) Process, Team Leaders Handbook, DOE-HDBK-XXX-98, November 1998.

4. DOE Line Management Environment, Safety and Health Oversight, DOE P450.5.

5. DOE Secretarial Policy Statement, Environment, Safety and Health Oversight, DOE P450.6.

6. Ohio Field Office Safety Management Policy (OH-40.S003).

7. Ohio Field Office Functions, Responsibilities, and Authorities Manual (FRAM), March 2, 1999.